National Institute of Environmental Health Sciences

Climate change, air pollution and extreme events leading to increasing prevalence of allergic respiratory diseases

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Year: 2013

Journal: Multidisciplinary Respiratory Medicine. 8 (2)

Abstract:

The prevalence of asthma and allergic diseases has increased dramatically during the past few decades not only in industrialized countries. Urban air pollution from motor vehicles has been indicated as one of the major risk factors responsible for this increase. Although genetic factors are important in the development of asthma and allergic diseases, the rising trend can be explained only in changes occurred in the environment. Despite some differences in the air pollution profile and decreasing trends of some key air pollutants, air quality is an important concern for public health in the cities throughout the world. Due to climate change, air pollution patterns are changing in several urbanized areas of the world, with a significant effect on respiratory health. The observational evidence indicates that recent regional changes in climate, particularly temperature increases, have already affected a diverse set of physical and biological systems in many parts of the world. Associations between thunderstorms and asthma morbidity in pollinosis subjects have been also identified in multiple locations around the world. Allergens patterns are also changing in response to climate change and air pollution can modify the allergenic potential of pollens especially in presence of specific weather conditions. The underlying mechanisms of all these interactions are not well known yet. The consequences on health vary from decreases in lung function to allergic diseases, new onset of diseases, and exacerbation of chronic respiratory diseases. Factor clouding the issue is that laboratory evaluations do not reflect what happens during natural exposition, when atmospheric pollution mixtures in polluted cities are inhaled. In addition, it is important to recall that an individual's response to pollution exposure depends on the source and components of air pollution, as well as meteorological conditions. Indeed, some air pollution-related incidents with asthma aggravation do not depend only on the increased production of air pollution, but rather on atmospheric factors that favour the accumulation of air pollutants at ground level. Considering these aspects governments worldwide and international organizations such as the World Health Organization and the European Union are facing a growing problem of the respiratory effects induced by gaseous and particulate pollutants arising from motor vehicle emissions.

Source: http://dx.doi.org/10.1186/2049-6958-8-12

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Extreme Weather Event, Temperature

Air Pollution: Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): NO2

Extreme Weather Event: Drought, Flooding

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Global or Unspecified

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Respiratory Effect

Respiratory Effect: Asthma, Upper Respiratory Allergy

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified